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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/577,626

04/28/2006

Ryuzo Iga

14321.84

9935

22913

7590

06/10/2009

Workman Nydegger
1000 Eagle Gate Tower
60 East South Temple
Salt Lake City, UT 84111

EXAMINER

STAFFORD, PATRICK

ART UNIT

PAPER NUMBER

2828

MAIL DATE

DELIVERY MODE

06/10/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/577,626	Applicant(s) IGA ET AL.	
	Examiner PATRICK STAFFORD	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4 and 16-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4 and 16-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1 May 2009 has been entered.

Response to Amendment

Claims 1, 3-4, 16-21 are pending.

Claims 2, 5-15 cancelled 1 May 2009.

Claims 1 and 16 amended 1 May 2009.

Response to Arguments

Applicant's arguments filed 1 May 2009 have been fully considered but they are not persuasive.

In response to applicant's argument that Takemi '483 does not teach the upper surface of said current-blocking layer having a substantially level region disposed below the topmost height of the upper surface and above the height of the topmost layer of said stacked body, and a layer thickness of said current-blocking layer is between 3 and 5 μm , Takemi '483 teaches an the upper surface of said current-blocking layer having a substantially level region disposed below the topmost height of the upper surface (Fig. 3, part 12, region in the middle of the part 12 below the topmost height of part 12) and above the height of the topmost layer of said stacked body

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(Fig. 3, part 12 section which meets the topmost layer of the stacked body part 24), and a layer thickness of said current-blocking layer is between 3 and 5 μm (translation pages 1-2, wherein the current blocking layer thickness is $1.5 \mu\text{m} + .4 \mu\text{m} + .4 \mu\text{m} + 1.2 \mu\text{m} = 3.5 \mu\text{m}$).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-4, 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahiro et al (Japanese Published Patent Application 03-053582, hereafter '582) in view of Takemi et al (U.S. Patent Application Publication 2004/0057483, hereafter '483) and further in view of Iga et al (U.S. Patent Application Publication 2002/0168856, hereafter '856).

Claims 1 and 16: '582 teaches a semiconductor optical device comprising:

a mesa-stripe stacked body (translation page 1, paragraph 2 and Fig. 3) including at least a p-type cladding layer (Fig. 3, part 23), an active layer (Fig. 3, part 19) and an n-type cladding layer (Fig. 3, part 24) is formed on a p-type InP substrate (translation page 1, paragraph 1, lines 9-10 and Fig. 3, part 21),

a current-blocking layer is buried in both sides of said stacked body (Fig. 3, parts 12-15), and an n-type over-cladding layer (Fig. 3, part 18) and an n-type contact layer (Fig. 3, part 22)

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are disposed on said current-blocking layer and said stacked body (Fig. 3, parts 18 and 22 disposed on part 12),

wherein said current blocking layer is a high resistive layer made of an InP crystal doped with Fe (translation page 2, paragraph 1 and Fig. 3, parts 12-15), the upper surface of said current-blocking layer having a substantially level region disposed below the topmost height of the upper surface (Fig. 3, part 12, region in the middle of the part 12 below the topmost height of part 12) and above the height of the topmost layer of said stacked body (Fig. 3, part 12 section which meets the topmost layer of the stacked body part 24), and a layer thickness of said current-blocking layer is between 3 and 5 μm (translation pages 1-2, wherein the current blocking layer thickness is $1.5 \mu\text{m} + .4 \mu\text{m} + .4 \mu\text{m} + 1.2 \mu\text{m} = 3.5 \mu\text{m}$); and

said n-type over-cladding layer is made of a semiconductor crystal having a property for flattening a concavo-convex shape of upper surfaces of said current-blocking layer and said stacked body (Fig. 3, part 18 flat upper surface).

‘582 does not explicitly teach an n-type dopant for said semiconductor crystal is a group VI element. However, ‘483 teaches a semiconductor optical device with an n-type semiconductor crystal with a group VI element as the dopant (paragraph 30, lines 9-12) in order to flat the surface of the cladding layer and reduce the number of crystal dislocations. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use an n-type semiconductor crystal with a group VI element as the dopant in order to flat the surface of the cladding layer and reduce the number of crystal dislocations.

‘582 and ‘483 do not teach the current blocking layer is a single high-resistive layer is doped with ruthenium. However, ‘856 teaches a current blocking layer being a single high

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resistive layer of InP crystal doped with ruthenium (paragraph 21) in order to act as an electron compensator. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a current blocking layer being a single high resistive layer of InP crystal doped with ruthenium in order to act as an electron compensator.

Claims 3 and 17: '582, '483 and '856 teach the semiconductor optical device according to claim 1. '483 teaches the n-type dopant is selenium (paragraph 30, lines 9-12).

Claim 4: '582, '483 '856 teach the semiconductor optical device according to claim 3. '483 teaches the doping concentration of the selenium is equal to or higher than $5 \times 10^{18} \text{ cm}^{-3}$ (paragraph 72, lines 2-4).

Claims 18 and 20: '582, '483 '856 teach the semiconductor optical device according to claim 1. '582 teaches the current- blocking layer is disposed directly on the p-type InP substrate so as to contact the p-type InP substrate (Fig. 3, part 15 disposed directly on part 21).

Claims 19 and 21: '582, '483 '856 teach the semiconductor optical device according to claim 18. '582 teaches the n-type over-cladding layer is disposed directly on the current-blocking layer so as to contact the current- blocking layer (Fig. 3, part 18 formed directly on part 12).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK STAFFORD whose telephone number is (571)270-1275. The examiner can normally be reached on M-Th 7:30-5 EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. S./

Examiner, Art Unit 2828

/Minsun Harvey/

Supervisory Patent Examiner, Art Unit 2828